micro-nodes **22** are connected together by fibrils **23**, leaving a number of spaces **24** therebetween.

A method will now be described of manufacturing a tube from a crystalline polymer material having such porous microstructures of PTFE. Initially, a liquid lubricant such as hydrocarbon oil, for example, solvent naphtha, white oil or petroleum ether is added to and mixed with a fine powder of PTFE or a coagulate of PTFE at a mixture ratio of 80:20 for PTFE and liquid lubricant. A small quantity of organic or inorganic additive may then be added with the mixture to form a compact, which is then extruded through a ram extruder into a tubular form, thus producing a molded product.

The liquid lubricant is then removed from the molded product. Though the liquid lubricant may be left in the product, the resulting final product is poor in quality. While it is unsintered (kept below 327° C.), it is lengthwise stretched to 1.2 to 15 times its original length. The internal strains in the stretched product are then thermally fixed at a temperature higher than its melting point or slightly less than that, preferably at a temperature between 200° and 390° C.

The crystalline polymer material having porous microstructures of PTFE thus obtained has an enhanced pliability, flexibility, heat resistance, chemical resistance, water repellency, non-adherence, sliding characteristic, stretchability, and elastic recovery. Usually, it has a wall thickness of 0.05 to 3.5 mm, in particular, 0.1 to 2.0 mm, a porosity of 30 to 90%, in particular, 60 to 80%, an average diameter of pores from 0.01 to 20 microns, in particular, 1 to 5 microns, a Gurley number (the length of time required for 100 c.c. of air to permeate under a pressure of 12.7 mmHg through a cross-sectional area of 6.45 cm^2) of 0.01 to 5000 seconds, and a water leakage pressure of 0.1 to 1.5 kg/cm^2. These properties can be varied as desired over a wide range by controlling the manufacturing parameters, thus enabling an intended material to be easily obtained.

A gas tightness and a water tightness are imparted to the resulting flexible tube in a manner mentioned below. A flexible tube is formed to have desired internal and external diameters and a desired length, and a solution of a plastic material having a gas/water tightness is uniformly applied to the internal surface of the tube to a thickness which is substantially comparable to the wall thickness of the tube. Such plastic materials may comprise FEP, fluorine resins such as a copolymer of ethylene tetrafluoride and perfluoroalkyl vinyl ether, fluorine rubber, polyurethane, polyimide, polyester, nylon, polyvinyl chloride, polyethylene or the like.

FIG. **4** shows tube **31** having plastic material **32** applied to its internal surface. One end of the tube is closed by plug **33** while connecting pipe **34** is hermetically fitted into the other end of the tube for pumping air into tube **31** by utilizing pump P. When the air is pumped into tube **31**, the plastic material **32** permeates into pores **24** (see FIG. **3**) of tube **31** under the air pressure, thus filling these pores. At the completion of the filling operation, pump P is deactuated, and plastic material **32** which is filled into tube **31** is allowed to solidify, whereupon connecting pipe **34** is disconnected from tube **31** and plug **33** also removed therefrom.

The resulting flexible tube **31** may be used as tube **10** which defines the forceps channel (see FIG. **2**). The tube **10** has all of the required characteristics including the gas/water tightness and high flexibility, and is also free from kinks, crushing and wrinkles in the tube wall. Additionally, the tube has a smooth internal wall surface.

It should be understood that a tube which defines the air/water feed channel can be manufactured in the same way.

While in the arrangement of FIG. **4**, the pressure has been applied to the internal surface of tube **31** in order to fill plastic material **32** into the pores of tube **31**, it should be understood that a suction may be applied to the external surface of the tube. Alternatively, after applying plastic material **32** to the external surface of tube **31**, a pressure may be applied to the external surface simultaneously with a suction applied to the internal surface of tube **31**.

While in the foregoing description, flexible tube **10** has been described as one used to form a forceps channel of an endoscope, it should be understood that the tube can equally be used in a small size fluid controlling instrument, piping between instruments or a variety of conduits of industrial endoscopes for which the described requirements of the tube are essential.

What is claimed is:

1. A flexible endoscope tube comprising a tubular body of a crystalline polymer material having a porous microstructure which include a number of micro-nodes which are coupled together by fibrils, and a synthetic resin material having water or gas tightness and stretchability which is filled into the pores of the porous microstructure.

2. A flexible tube according to claim **1** in which the crystalline polymer material comprises a fluorine resin or polyolefin.

3. A flexible tube according to claim **2** in which the fluorine resin comprises polytetrafluoroethylene.

4. A flexible tube according to claim **2** in which the polyolefin comprises polypropylene resin.

5. A flexible tube according to claim **2** in which the fluorine resin comprises polytetrafluoroethylene containing extractable silicate, carbonate, metal, metal oxide, sodium chloride, ammonium chloride, copolymer of tetrafluoroethylene and hexafluoropropylene, starch or sugar.

6. A flexible tube according to claim **1** in which the synthetic resin material comprises a fluorine resin, polyurethane, polyimide, polyester, nylon, polyvinyl chloride or polyethylene.

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